Quality of Life and Quality of Care in Patients With Diabetes Experiencing Different Models of Care

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OBJECTIVE — To study variation in quality of life and quality of care in patients with diabetes experiencing three different models of care: traditional hospital care, hospital/general practitioner (GP) shared care, and structured GP care.

RESEARCH DESIGN AND METHODS — A cross-sectional study involving 1,456 patients with diabetes (71% response rate) was conducted. Quality of life was assessed with the Audit of Diabetes-Dependent Quality of Life (ADDQoL) instrument and quality of care with a 10-point process-of-care report card.

RESULTS — The adjusted odds ratio (OR) for a high (upper quartile) ADDQoL score was significantly increased in the structured care relative to the traditional hospital care group (OR 1.7 [95% CI 1.2–2.5]). A significantly higher proportion of structured GP care patients reported compliance with seven or more key process-of-care measures compared with the other models of care.

CONCLUSIONS — Diabetes quality of life may be enhanced when care is provided in a primary care setting without compromising quality of care.

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There is considerable variation in diabetes care models internationally, with care anchored in primary care, in secondary care specialist centers, or in shared care systems involving both general practice and hospital-based care (1–5). There is extensive evidence that for the majority of patients with diabetes, particularly those with type 2 diabetes, it is possible to deliver care in the primary care setting that is at least as good as that provided in specialist hospital centers (6). The effects of different models of care on diabetes-related quality of life are less well defined.

The objective of the study was to investigate differences in quality of life and quality of care across three different models of care currently available in Ireland.

RESEARCH DESIGN AND METHODS — We carried out a cross-sectional questionnaire study involving 2,049 people aged 20–75 years with a confirmed diagnosis of type 1 or 2 diabetes. Participants were recruited from three different models of care in different regions of Ireland: *1*) traditional hospital care with standard referral and discharge letters between primary and secondary care and patients attending hospital-based clinics on an annual basis (*n* = 1,245); *2*) hospital/general practitioner (GP) shared care with local clinical guidelines, protocols, and quality assurance systems and annual hospital-based review and communication across the primary-secondary interface facilitated by the community diabetes nurse specialist (4) (*n* = 225); and *3*) structured GP care with

local clinical guidelines, protocols, and quality assurance systems and practice visits by community-based dietitians, chiropodists, and a primary care diabetes liaison nurse, but without a local specialist diabetes unit (1) (*n* = 579). The self-completed questionnaire addressed standard demographic, social, and clinical factors including age, sex, marital, employment, educational, and health insurance status, type of diabetes, treatment, and complications. Quality of life was assessed with the Audit of Diabetes-Dependent Quality of Life (ADDQoL) instrument (7) and general health status using the Short Form 36 (SF-36) questionnaire instrument (8). Quality of care was assessed with a patient-completed report card based on 10 process-of-care measures carried out in the last year for diabetes: three or more GP visits for diabetes, A1C measurement, blood pressure measurement, urine tested for protein, prescription of aspirin and cholesterol-lowering medication, foot and dilated eye examination, consultation with dietitian, and smoking assessment.

The standard χ^2 test and nonparametric methods were used to compare the distribution of relevant categorical variables and median ADDQoL scores in subgroups of patients with diabetes. The prevalence odds ratio for an ADDQoL score in the upper quartile of the distribution was estimated for the shared care and structured care models relative to the traditional mixed care model using binary logistic regression with adjustment for relevant confounders. The study was approved by the research ethics committee of the Cork Teaching Hospitals.

RESULTS — The response rate was 71% (*N* = 1,456). The age and sex distribution was similar across the three models of care. However, in the traditional hospital care group, a higher proportion of participants had type 1 diabetes, received insulin, and had documented diabetes complications. Quality of care was higher in the structured GP care group than in the traditional hospital or hospital/GP shared care groups for all process-of-care measures, with the exception of

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Table 1—Determinants of the ADDQoL score in patients with types 1 and 2 diabetes

	OR*	95% CI	*P*	OR†	95% CI	*P*
Female vs. male sex	0.97	0.76–1.25	0.81	1.35	0.92–1.97	0.12
Age (years)						
40–59 vs. 20–39	1.23	0.73–2.06		1.29	0.57–2.91	
≥60 vs. 20–39	1.85	1.12–3.05	<0.01	2.07	0.87–4.93	0.72
Type 2 vs. type 1 diabetes	1.49	1.03–2.16	0.04	2.2	1.04–4.66	0.04
Insulin vs. noninsulin use	0.53	0.39–0.72	<0.001	0.92	0.52–1.64	0.78
Health services coverage						
Medical card plus private insurance vs. medical card	1.26	0.84–1.90		1.19	0.69–2.04	
Private insurance vs. medical card	1.76	1.25–2.47	<0.01	1.04	0.64–1.70	0.83
Education						
Secondary higher cycle vs. primary/lower secondary cycle	1.31	0.93–1.84		1.32	0.82–2.12	
Third level vs. primary/lower secondary cycle	1.56	1.03–2.36		1.98	1.11–3.50	
Postgraduate vs. primary/lower secondary cycle	1.18	0.56–2.48	0.12	1.73	0.67–4.47	0.10
Employed vs. unemployed	1.45	1.08–1.96	0.01	1.05	0.66–1.67	0.84
Married vs. unmarried	0.95	0.73–1.23	0.69	0.91	0.62–1.34	0.64
Models of care						
Hospital/GP shared care vs. traditional mixed	1.33	0.87–2.04		1.45	0.74–2.80	
Structured GP care vs. traditional mixed	1.6	1.22–2.09	<0.01	1.71	1.16–2.54	0.02
Diabetes complications						
One vs. none	0.59	0.42–0.82		0.90	0.55–1.46	
Two or more vs. none	0.37	0.28–0.50	<0.001	0.69	0.44–1.08	0.23
SF-36 PCS physical function upper quartile vs. quartiles 1–3	3.74	2.75–5.10	<0.001	3.09	2.46–5.55	<0.001
SF-36 MCS mental function upper quartile vs. quartiles 1–3	3.24	2.39–4.40	<0.001	2.20	2.08–4.59	<0.001

*Logistic regression model for each variable, adjusted for age and sex only. †Logistic regression model adjusted for age, sex, and all other variables in the table. MCS, mental component summary; PCS, physical component summary.

ophthalmic review and smoking assessment. The structured GP care model had a higher proportion of patients who completed seven or more process-of-care measures (55%) relative to those of the traditional hospital care group (35%) and hospital/GP shared care model (37%).

Diabetes exerts a significant negative impact on quality of life with median ADDQoL scores of −1.73 and −1.67 in men and women, respectively. The most negatively impacted domains in the ADDQoL instrument were freedom to eat, enjoyment of food, freedom to drink, and worries about the future. Diabetes-related quality of life was marginally better in older patients, in those of higher educational status, and in the employed relative to the unemployed patients. Diabetes quality of life was significantly lower in divorced and separated patients, those without private health insurance, patients with type 1 diabetes, type 2 diabetic patients on insulin, and in patients with one or more diabetes complications. Patients in the structured GP care model had significantly higher ADDQoL scores (median −1.22) compared with those in the hospital/GP shared care and traditional mixed care groups (median −1.77 and −1.88, respectively).

In multivariate analyses, structured GP care and higher physical and mental functioning were associated with a significantly higher ADDQoL score, whereas type 1 diabetes was associated with a lower diabetes-related quality-of-life score (Table 1).

CONCLUSIONS — The findings highlight the impact of diabetes on quality of life with particular reference to the effects on freedom to eat, enjoyment of food, freedom to drink, and worries about the future. Relative to the overall negative effects of diabetes on quality of life, the effect of specific sociodemographic and clinical factors was fairly modest. This is consistent with previous work (9–10).

Patients in the structured GP group were almost twice as likely to have higher quality-of-life scores as patients in the traditional mixed care model in analyses adjusted for age, sex, diabetes complications, and other potential confounders. Patients in the structured care group also reported significantly higher compliance rates for 7 of 10 process-of-care measures compared with those in the other models of care.

The cross-sectional, nonexperimental design is an important limitation of this study as well as the lack of objective outcome data such as GHb. Patients in the traditional mixed care group were more likely to have type 1 diabetes and diabetes complications. Although we adjusted for these factors, there may be additional markers of morbidity unaccounted for in our analyses. In the context of this cross-sectional study, it should also be noted that a patient may well need to be seen in all three models at different stages of the disease, not just in primary care.

In summary, we have highlighted important determinants of quality of life in patients with diabetes and provided evidence to suggest that diabetes quality of life may be enhanced when care is provided by GPs in a primary care setting.

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